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A24C 5/18

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GB 2170692 A

GB 2069310 A

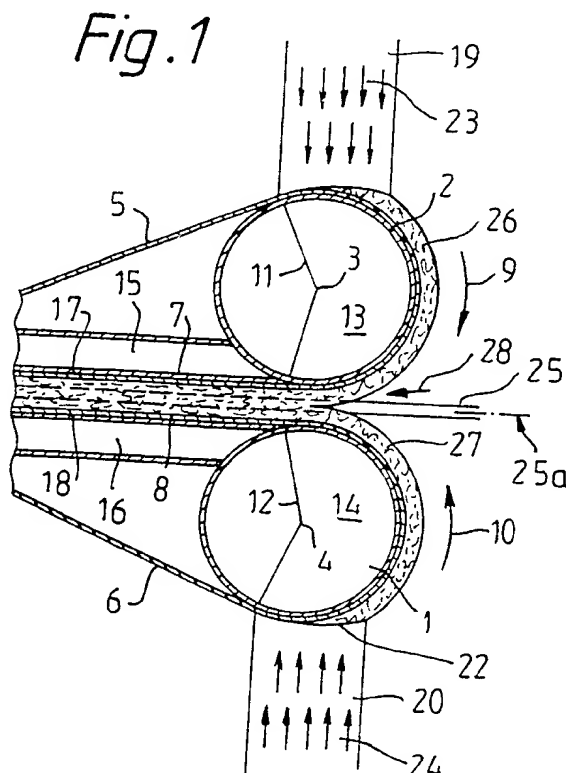
(58) Field of search

UK CL (Edition L) A2C CEFB CGFC

INT CL<sup>5</sup> A24C 5/18

(54) Cigarettes with inserts

(57) A process for manufacturing a rod of smoking material with a continuous or interrupted axially extending insert 25 includes applying a layer of material to the surface of a conveyor and combining said material on the conveyor and the insert in a combining zone which extends along a substantially straight axis in which the plane of the surface of the conveyor and the axis of the insert are substantially parallel, and which includes applying said layer of material to the conveyor outside said combining zone with the plane of the surface of the conveyor in a different plane to that of its surface in the combining zone.



GB 2 260 887 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

Fig. 1

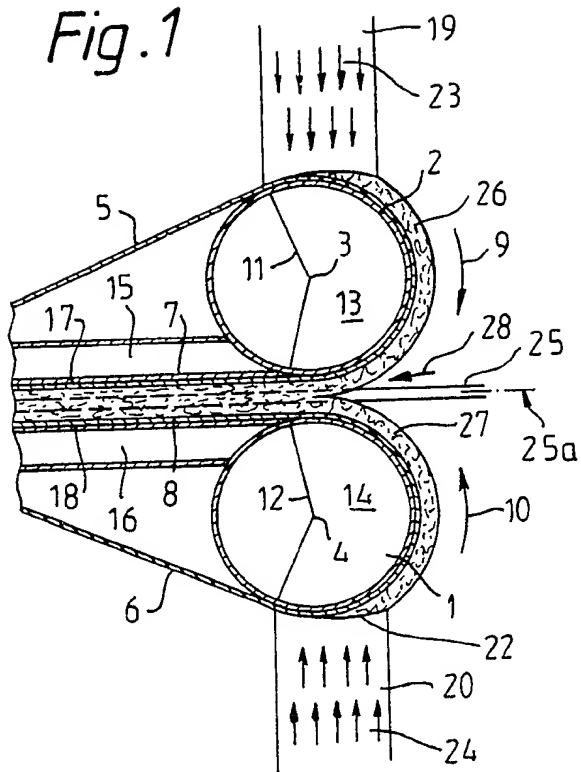


Fig. 2

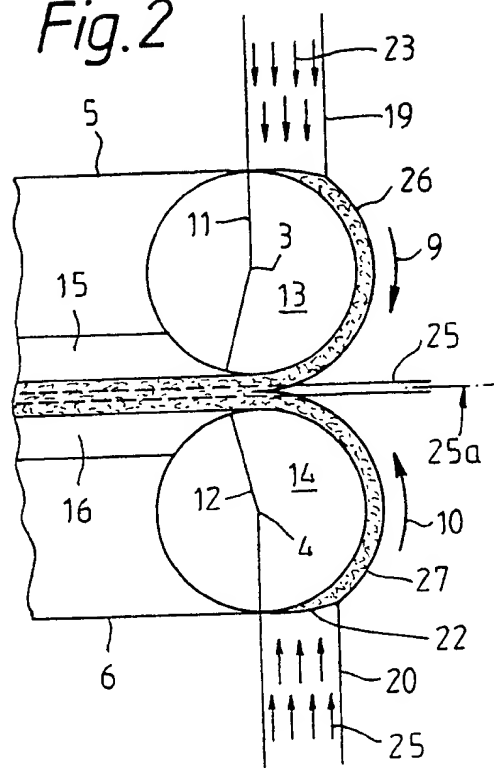


Fig. 3

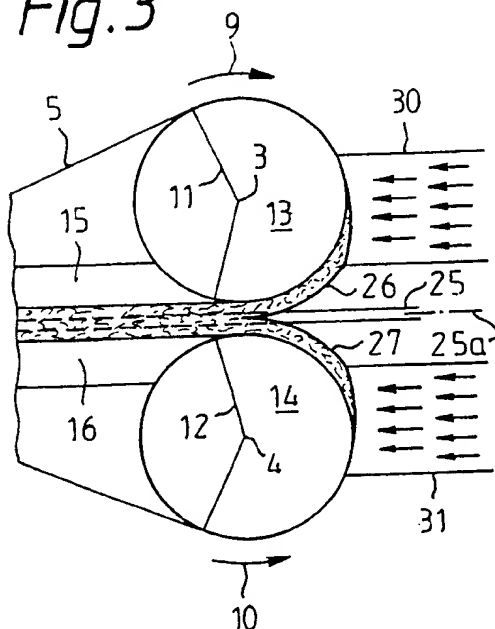


Fig. 4

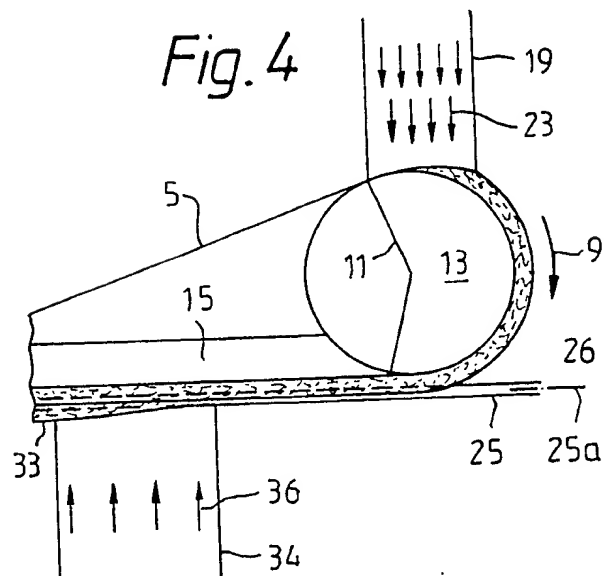


Fig. 5

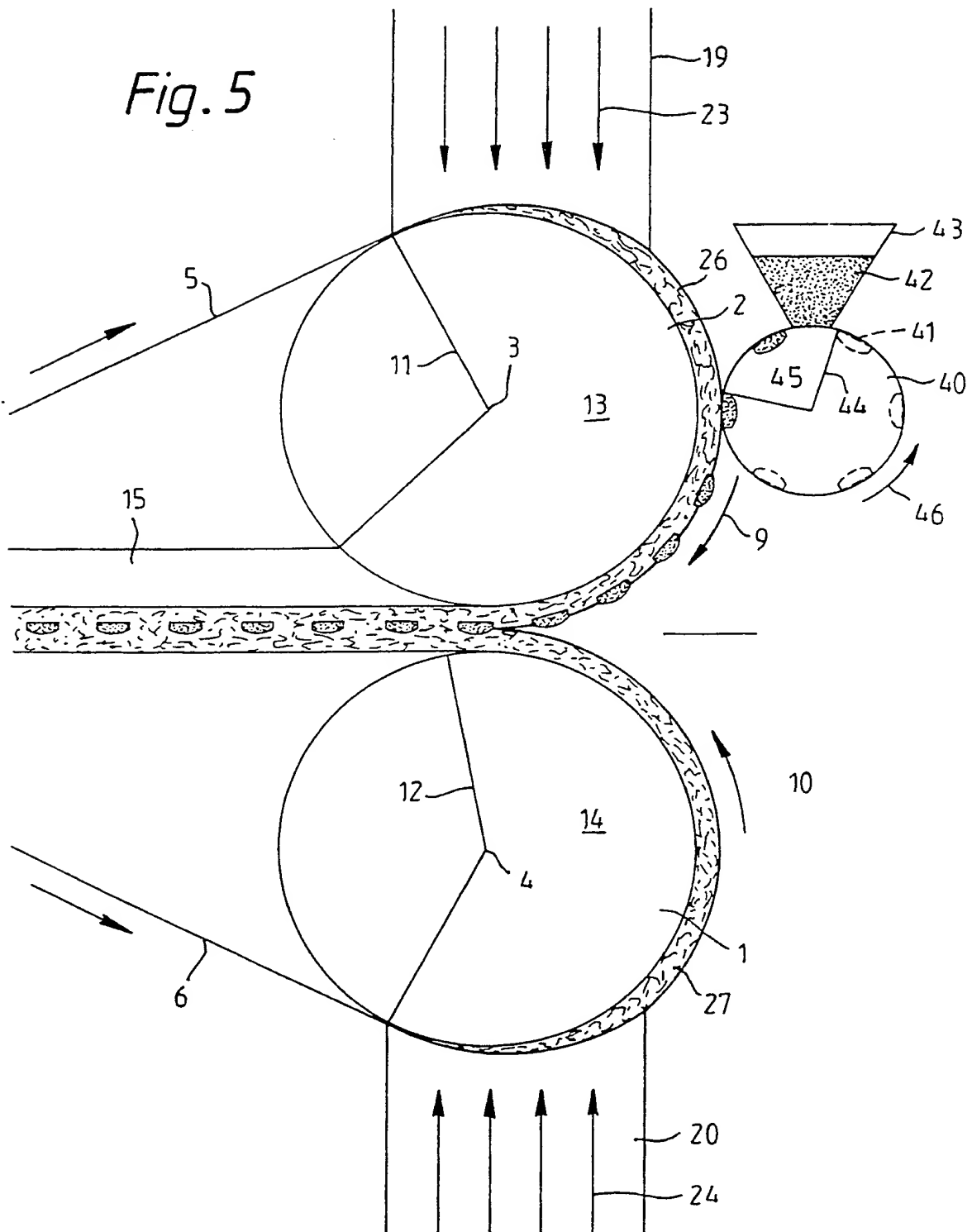


Fig. 6

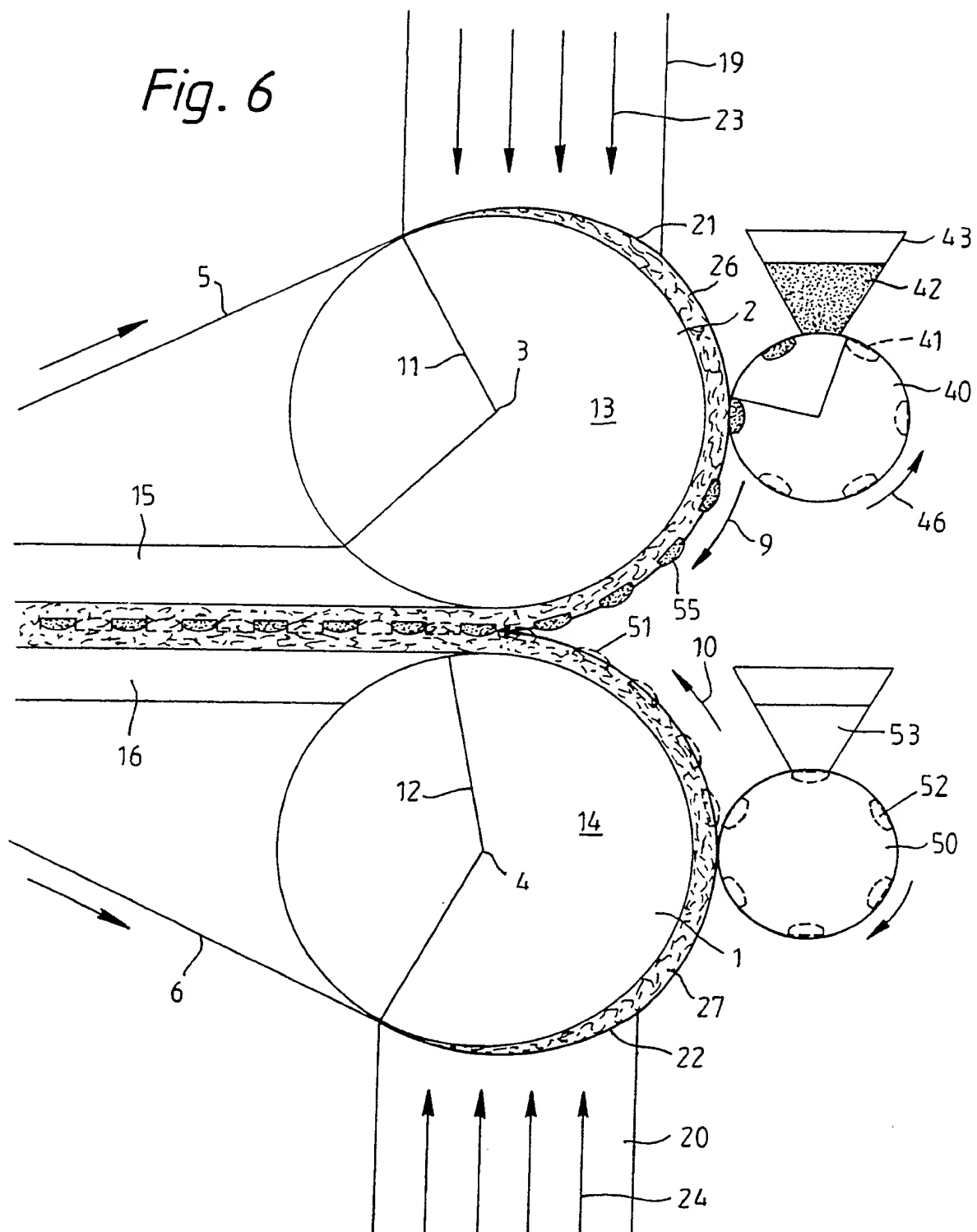


Fig. 7 is a schematic diagram of a medical device, possibly a catheter or probe, featuring two circular chambers and a central shaft. The top chamber (11) is divided into three segments (13, 14, 15) and is surrounded by a textured layer (21). The bottom chamber (12) is also divided into three segments (13, 14, 15) and is surrounded by a textured layer (22). A central shaft (60) passes through both chambers, with a textured section (25a) located between them. The shaft is connected to a handle assembly (61, 62, 63, 64, 65) on the right. Arrows indicate fluid flow: downward flow (23) into the top chamber, upward flow (24) from the bottom chamber, and flow (5, 6) along the outer walls of the chambers. Various components are labeled with numbers: 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 25a, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65.

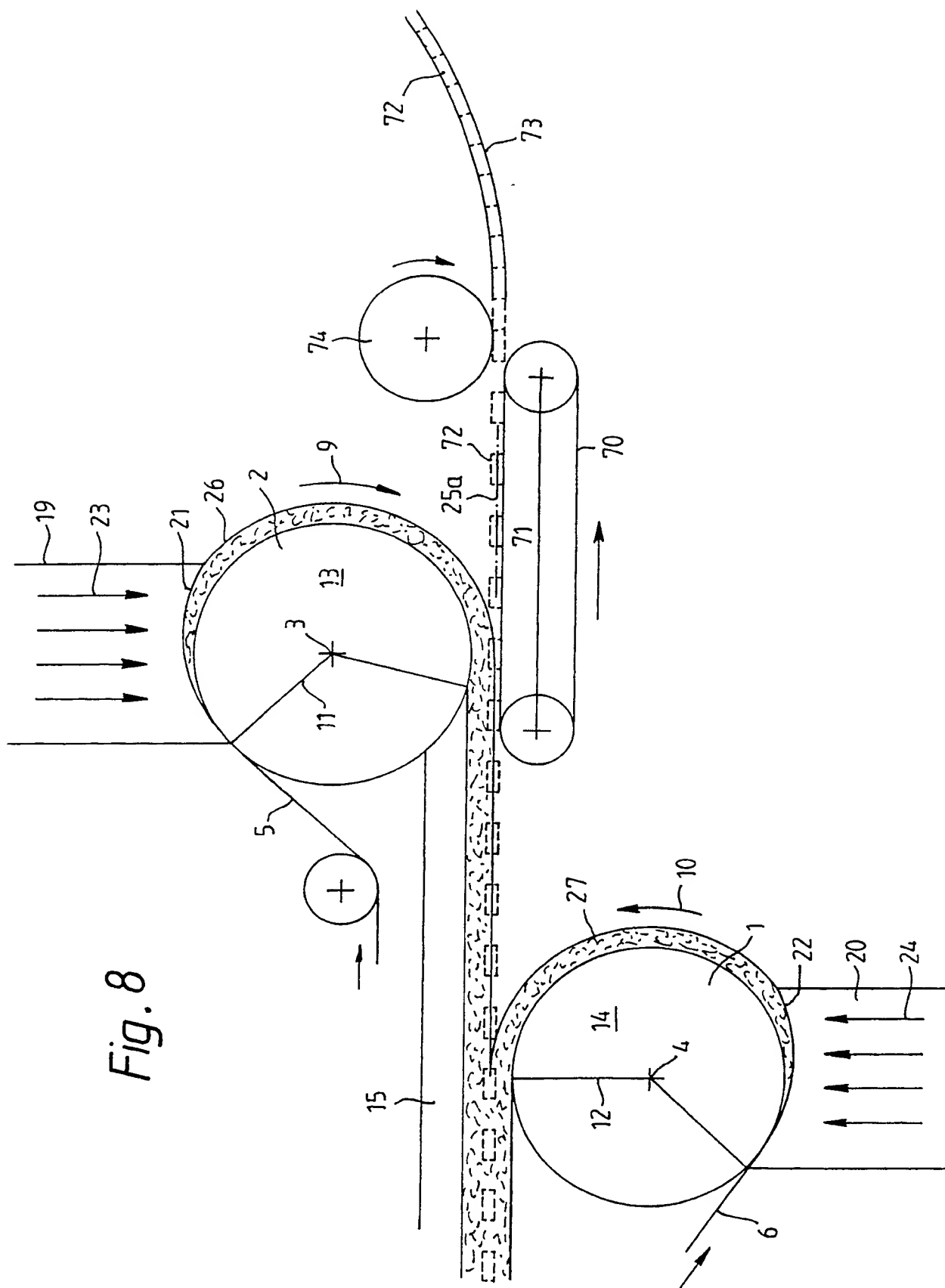


Fig. 8

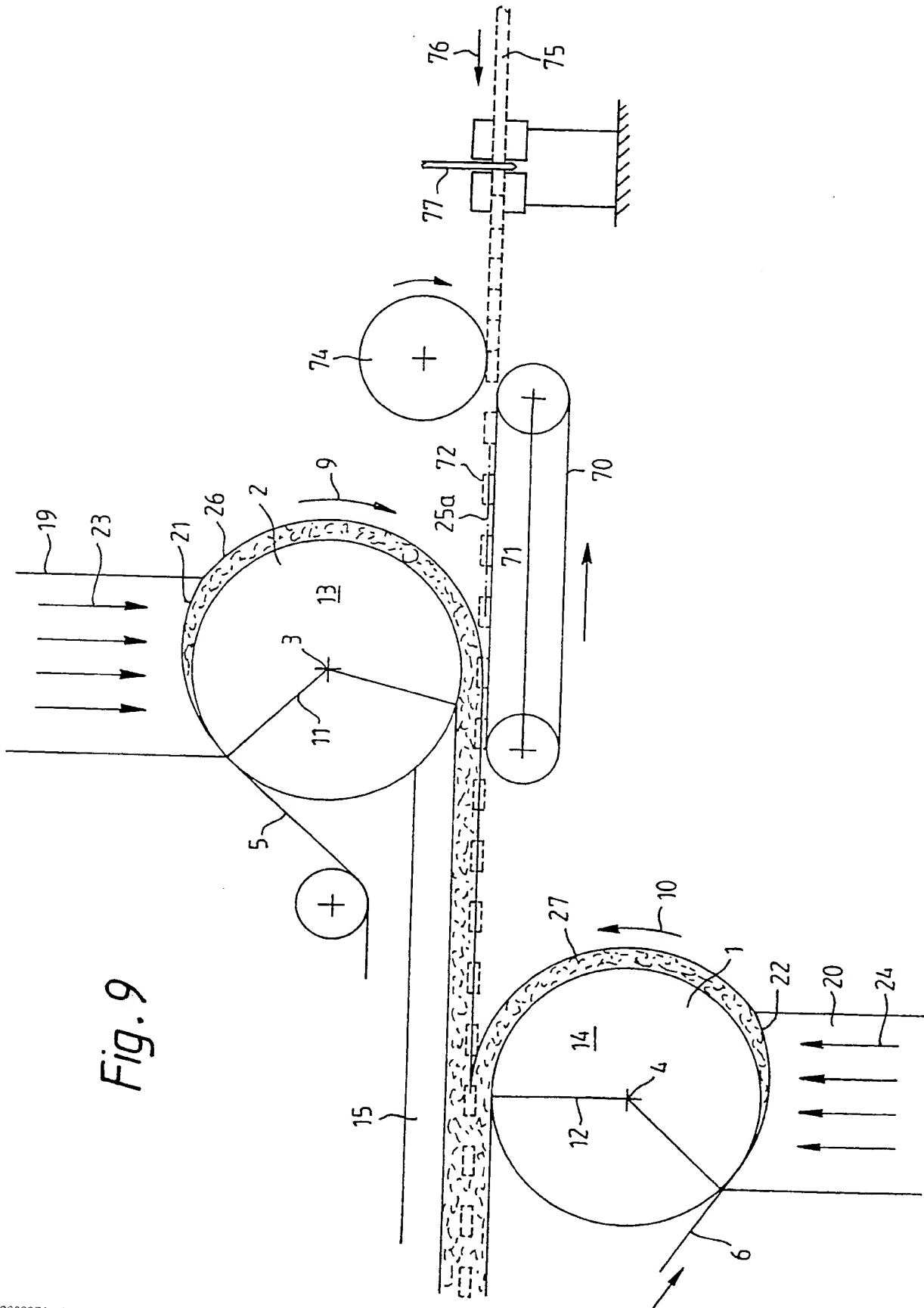


Fig. 9

Fig. 10

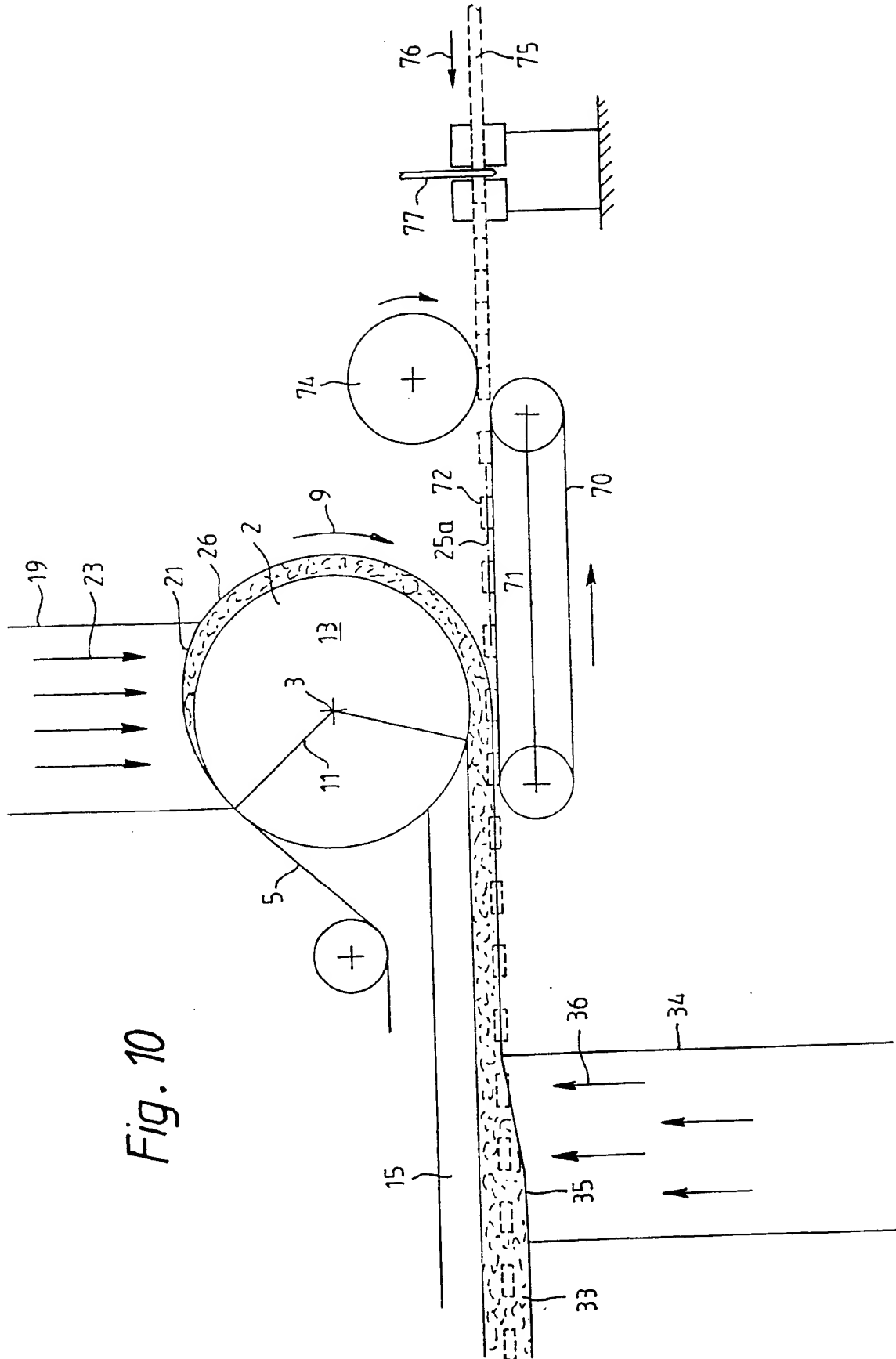




Fig. 11 is a schematic diagram of a mechanical assembly. It features two circular components, 13 and 14, which are part of a larger system. Component 13 is the upper circle, with center 3 and radius 11. It has an outer shell 2 and an inner layer 26. Component 14 is the lower circle, with center 4 and radius 12. It has an outer shell 1 and an inner layer 22. A horizontal bar 79 is positioned between the two circles. A rod 80 with a tip 80a is shown on the right, pointing towards the bar 79. Various flow indicators are present: arrows 23 and 19 at the top, arrows 20 and 24 at the bottom, and arrows 5 and 6 on the left. Curved arrows 9 and 27 indicate rotational motion for components 13 and 14 respectively. Other labels include 15, 16, 17, 18, 21, and 24.

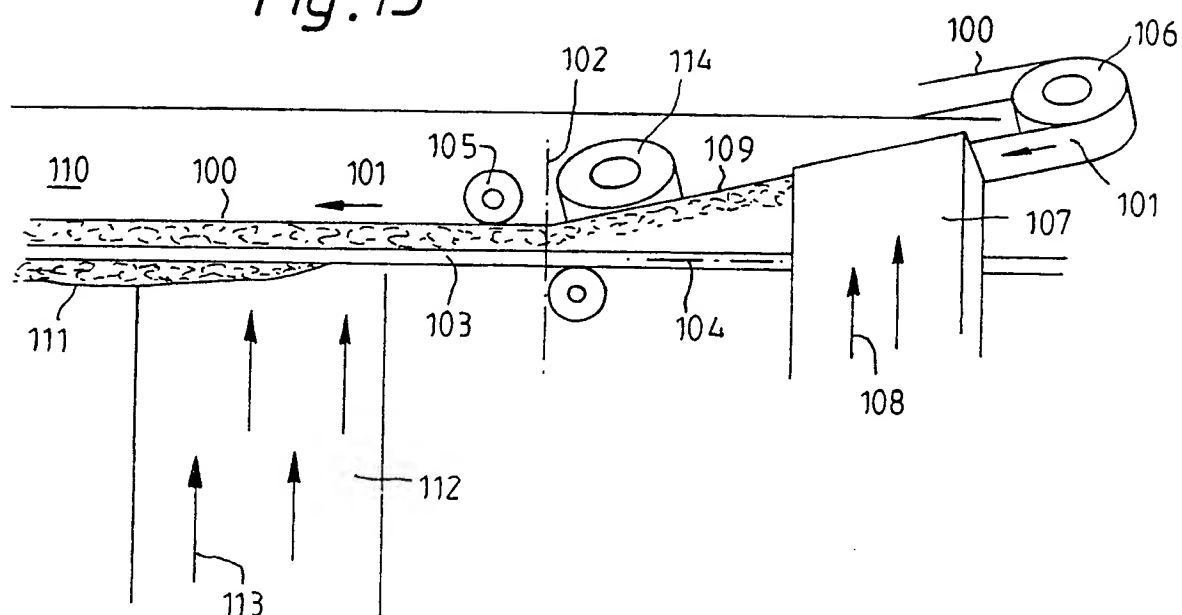
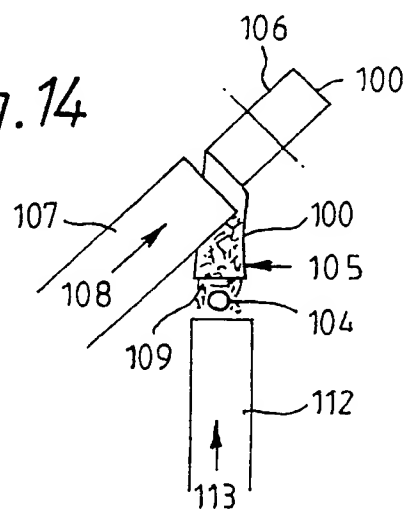
*Fig.13**Fig.14*

Fig.15

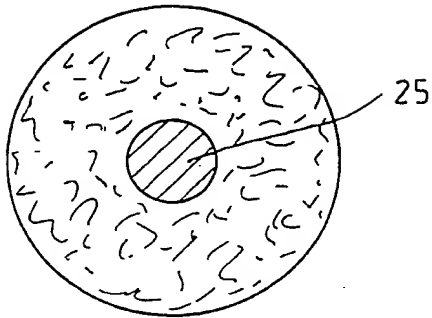


Fig.16

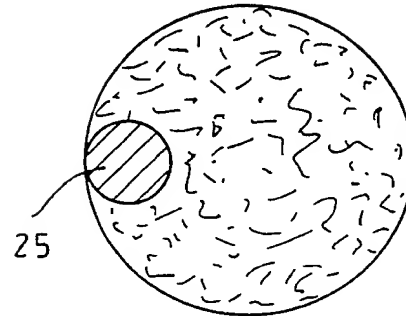


Fig.17

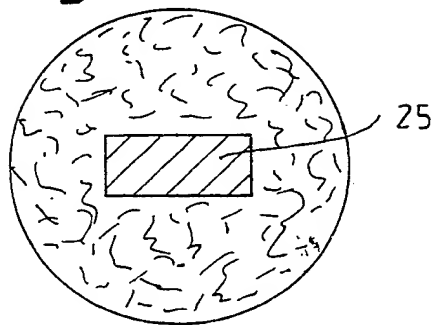


Fig.18

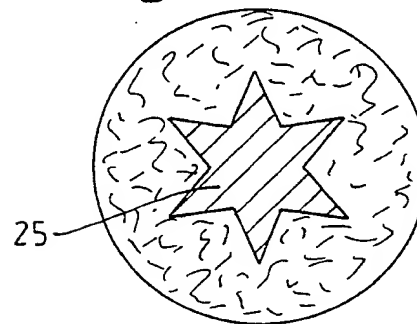


Fig.19

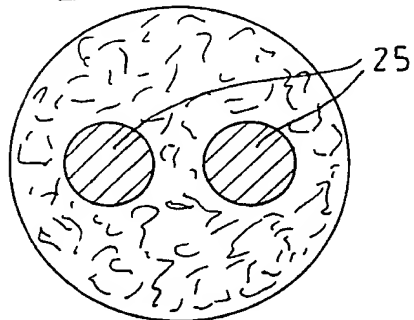


Fig.20

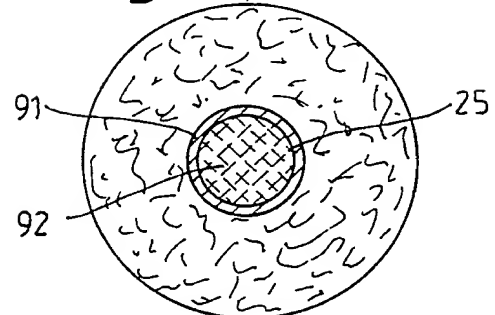


Fig.21

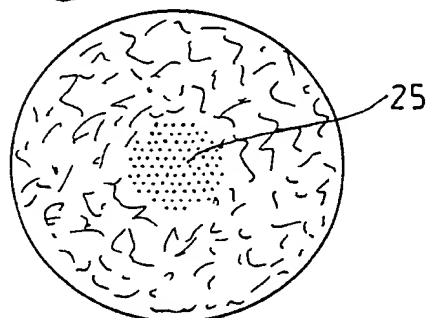
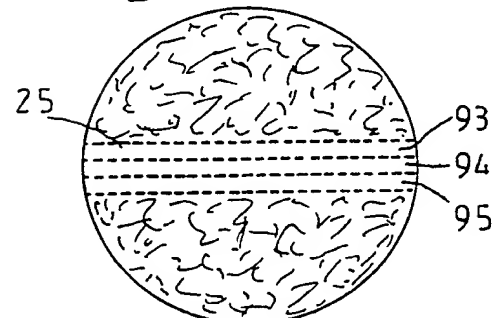


Fig. 22



PROCESS AND APPARATUS FOR MANUFACTURING A ROD OF SMOKING MATERIAL

This invention relates to a process and apparatus for manufacturing a rod of smoking material with a continuous or interrupted axially extending insert.

The term "smoking material" is used herein to include not only tobacco, tobacco substitute, any other kind of material which is smoked, but also filter material which can be made up into a rod.

There are difficulties in introducing axially extending inserts into tobacco or filter material when a rod of such material is being formed and which can subsequently be cut into smoking lengths before or after wrapping or otherwise defining its shape and the present invention is intended to provide a process and apparatus which can be used for introducing such inserts.

It is known, for a example from British Patent Specification No. GB 2 170 985 A to supply smoking material to a conveyor which extends in a straight axis through a zone where the tobacco is combined with an axially extending insert. In this construction the tobacco is supplied to the conveyor before it reaches a combining zone but with its surface in the same plane and the insert is applied in the form of a continuous rod to the tobacco at an angle prior to entering the combining zone. Because of the the configuration of this construction it is necessary to introduce the insert at an angle in order to allow the tobacco to be supplied to the conveyor without interference from the insert itself. A disadvantage with this construction is that the insert has to be bent around an angle which is likely to damage the insert during fabrication of the rod, especially if the insert is made of

a frangible material. Moreover, this process cannot be used if the insert material is rigid or substantially inflexible.

British Patent Specification No. GB 2 170 692 A also shows a method of combining smoking material and an insert in a combining zone in which the smoking material is applied to a conveyor whilst the insert passes along it. Although the drawing of the made up rod shows the insert located coaxially this is not possible with the construction shown because the rod itself blanks the surface of the conveyor and will prevent tobacco from reaching the conveyor behind it. Rods made with this apparatus must, essentially, have the insert displaced to one side.

The present invention is intended to provide a method and apparatus for making a rod of smoking material with an axially extending insert in which the disadvantages of the methods described in the earlier construction are overcome.

According to the present invention a process for manufacturing a rod of smoking material with a continuous or interrupted axially extending insert includes applying a layer of material to the surface of a conveyor and combining said material on the conveyor and the insert in a combining zone which extends along a substantially straight axis in which the plane of the surface of the conveyor and the axis of the insert are substantially parallel, and which includes applying said layer of material to the conveyor outside said combining zone with the plane of the surface of the conveyor in a different plane to that of its surface in the combining zone.

Due to the smoking material being applied to the conveyor outside the combining zone and with the plane of the surface of the conveyor being in a different plane to that of the surface in the combining zone it is possible to

supply the smoking material to the conveyor without the insert blanking the surface of the conveyor.

In one preferred method the insert is moved into the combining zone along a feed axis co-axial with the axis of the insert when in the combining zone. Thus, a rod can be made with the insert located co-axially and without bending the insert which might cause damage. The process can also be used with a rod of material which is rigid or substantially inflexible. If desired however the insert can be flexible, thus the process is versatile. It will be appreciated that the insert can also be located at any desired position within the rod using this method.

The insert can be in the form of a continuous element or a spray and the element can be substantially rigid or inflexible for example as a rod, tube, or cylinder. Alternatively the insert may be in the form of spaced rods, tubes, cylinders, slugs or capsules or as an interrupted spray.

Another method includes providing an interrupted axially extending insert along a curved path into the combining zone.

The process can include supplying said material to a foraminous conveyor and applying a vacuum to hold it in place thereon, and the insert may also be at least partially held in place by the vacuum.

A preferred process includes providing a layer of smoking material on a first face of a moving foraminous conveyor, applying a vacuum to a second face of the conveyor, applying an insert to the outer face of said layer and applying a further layer of smoking material over said insert.

With the material held in place by the vacuum it can be transported by the conveyor to, for example, wrapping means in the form of a garniture.

The process may conveniently include supplying said smoking material to the foraminous belt whilst it passes around a foraminous drum within which the vacuum is applied. Thus the surface of the conveyor is in a different plane to that when it is in the combining zone.

In another method according to the invention the material is applied to the conveyor at a point where the plane of the surface of the conveyor is inclined in relation to its plane in the combining zone.

The second layer can also be applied by a second foraminous belt to which a vacuum is applied and, again, the smoking material can be applied to the second foraminous conveyor whilst it passes around a foraminous drum within which a vacuum is applied.

The invention also includes apparatus for carrying out the process set forth above which comprises means for applying a layer of smoking material to the surface of a conveyor, means for combining said material on the conveyor and a continuous or interrupted axially extending insert in a combining zone which extends long a substantially straight axis, in which the plane of the surface of the conveyor and the axis of the insert are substantially parallel and in which said means for applying the material to the conveyor are outside the combining zone and apply the material at a point where the surface of the conveyor is in a different plane to that of its surface in the combining zone.

In one preferred construction means are included for moving said insert into the combining zone along a feed axis

co-axial with the axis of the insert when in the combining zone.

In another preferred construction means are included for moving an interrupted axially extending insert along a curved path into the combining zone.

The construction may comprise means for providing a layer of smoking material on a first face of a moving foraminous conveyor, means for applying a vacuum to a second face thereof, means supplying an insert to the outer face of said layer and means for applying a further layer of smoking material over said insert.

With the above arrangement means can be provided for supplying said layer of smoking material to said foraminous conveyor whilst it passes over a foraminous drum within which said vacuum is applied, or the material can be applied to the conveyor at a point where the plane of the surface of the conveyor is inclined or twisted in relation to its plane in the combining zone.

The invention can be performed in many ways and some embodiments will now be described by way of example and with reference to the accompanying drawings in which :

Figure 1 is a diagrammatic side elevation of apparatus according to the invention;

Figure 2 is a diagrammatic side elevation of an alternative construction;

Figure 3 is a diagrammatic representation of another alternative construction;



Figure 4 shows another construction according to the invention;

Figure 5 is a diagrammatic side view of a construction showing the use of a powder insert;

Figure 6 shows another construction using a powder insert;

Figure 7 is a diagrammatic side view of apparatus using a crimped rod or tube insert;

Figure 8 is a diagrammatic side view showing apparatus for incorporating interrupted axial inserts;

Figures 9 and 10 show further constructions for the employment of interrupted inserts;

Figure 11 shows a construction which can be employed with a powder or fluid insert;

Figure 12 is a diagrammatic view of another construction in which the smoking material and its insert are delivered to means for wrapping the layer around the insert;

Figure 13 is a diagrammatic side view of a further construction;

Figure 14 is a diagrammatic end view of the construction shown in Figure 13; and

Figures 15 to 22 are diagrammatic cross-sectional views of smoking material with various kinds of insert.

The apparatus shown diagrammatically in Figure 1 is for use in the manufacture of a tobacco or filter material rod with a continuous axially extending insert in the form of a rod, tube, cylinder shaped extrusion or the like which can be substantially rigid or inflexible, or which can be made from a frangible material which will fracture if bent. If desired the insert can of course be made from a flexible material. In this construction the apparatus comprises two spaced apart cylindrical drums 1 and 2. The cylindrical walls of the drums are pierced or made of suitable material so that they are foraminous and the drums are mounted to rotate about their horizontal axes 3 and 4. A foraminous conveyor is provided around each drum in the form of a perforated band shown at 5 and 6 the bands being tensioned and passing around drive pulleys, not shown. As will be seen from the drawing the horizontal run 7, 8 on each band is parallel with the other and the direction of rotation of the bands 5 and 6 and drums 1 and 2 is shown by arrows 9 and 10.

Each drum is divided into two volumes by partition walls 11 and 12 and means are provided to create vacuums in the chambers 13 and 14. Horizontally extending vacuum boxes 15 and 16 are also provided and have support walls/rails 17, 18 against which the perforated bands run when the apparatus is in operation.

Each drum 1 and 2 has an associated vertically extending tobacco funnel 19, 20 the lower ends 21 and 22 of which are shaped so that when tobacco is supplied through the funnel with an air flow indicated by arrows 23, 24 the tobacco can escape in a layer onto the appropriate drum 1 and 2.

A continuous insert 25 is fed from the right hand side of the apparatus by any appropriate feeding means.

In use a vacuum is applied to the chambers 13, 14, 15 and 16 and the perforated bands 5 and 6 rotate with the outer walls of the drums 1 and 2. The partitions 11 and 12 are mounted so that they are stationery. The tobacco is fed through the funnels 19 and 20 and as the bands 5 and 6 pass the funnels tobacco is pulled onto each band as a layer 26, 27. The thickness of the layer is regulated by the amount of tobacco fed into each funnel and by tamping down or trimming off excess with an ecreteur (not shown). The insert 25 is introduced onto the layer of material 26 tangentially and moves along on the surface of the tobacco being held in place at least partially by the vacuum from the chamber 13 of the drum 2. In the construction shown in Figure 1 the lower layer of tobacco 27 simultaneously covers the side of the insert opposite to the side which is engaging the layer 26 and the covering layers and insert move along with the perforated bands 7 and 8 in the direction of the arrow 28.

A combining zone exists in the direction of movement from the point at which the insert 25 meets the layer 26 and where the surface of the band and the axis of the insert are parallel. The feed axis of the insert indicated by reference numeral 25a is co-axial with the axis of the insert in the combining zone. It will also be seen that the plane of the surface of the band 26 is different to that of the surface in the combining zone.

The layers and insert are delivered to a rod making machine which may incorporate a garniture of known kind where a paper wrapping is applied and the usual cutting apparatus is provided to cut the cigarette rod into the required lengths.

In the arrangement shown in Figure 1 the insert is applied centrally between the two layers of tobacco material

but if desired it could be introduced from one side, the centre or anywhere across the tobacco layer. Again, in the arrangement shown in Figure 1, the apparatus is for forming a rod of tobacco material but it will be appreciated that apparatus of this kind can be equally well employed for making cigarette filters.

Figure 2 shows a similar construction to Figure 1 but this drawing has been simplified to make it more clear although the same reference numerals are used to indicate similar parts. In this arrangement however the run of the perforated bands 5 and 6 is horizontal at both sides and the tobacco funnels are somewhat narrower, this construction being more suitable for slower running machines.

Figure 3 shows another construction rather similar to Figure 1 but in which the tobacco material is supplied through horizontally extending funnels 30, 31.

Figure 4 shows another alternative construction in which a first layer of tobacco 26 is applied in the manner shown in Figure 1, the insert 25 and tobacco layer being held in place by the vacuum in the chambers 13 and 15 and a second layer of tobacco material 33 is applied directly to the outer surface of the first layer 26 so that the insert 25 is covered through a funnel 34. The tobacco material is supplied by an air flow indicated by arrows 36.

Figure 5 shows apparatus for supplying an interrupted insert in the form of an axially extending series of slugs of a granular or particle material. In this construction the same reference numerals are again used to indicate similar parts to those shown in Figure 1 and the upper part of the apparatus is similar to the Figure 1 construction but with the addition of a rotating feed wheel 40 which has indentations 41 to receive a granular or particulate

material 42 fed from a hopper 43. The feed wheel has an inner dividing wall 44 to form a chamber 45 to which a vacuum may be supplied. The wheel 40 rotates in the direction of the arrow 46 and its peripheral surface speed is arranged to be the same as the moving outer surface of the tobacco layer 26.

Granular or particulate material 42 is fed into the indentations 41 the inner walls of which are arranged to be permeable so that the material is held until it reaches the tobacco layer 26 on the drum 2. As the vacuum in the chamber 45 is now released the slug of material becomes attached to the tobacco material by reason of the vacuum in the chamber 13 and is carried round with the tobacco layer. In this construction the lower tobacco layer 27 is again applied in a similar manner to that shown in Figure 1, the two layers of material which have now combined into one layer with the slugs of powder, granule or particulate material embedded in them is held by the vacuum in the chambers 15 and 16.

With this construction and method the interrupted insert is moved along a curved path into the combining zone which commences where the two layers 26 and 27 meet.

Figure 6 shows a similar construction to Figure 5 but in this arrangement a second filler wheel 50 is provided which deposits a second series of slugs of powder 51 this time onto the lower layer of material 27. The indentations 52 in the second wheel 50 are arranged so that the material 53 is deposited onto the layer 27 and are spaced between the slugs of material 55 on the layer 26 so that a multiple axially extending insert is provided in the combined layers of material.

Figure 7 shows a construction for feeding a crimped rod or tube as an insert, which may or may not be flexible, and again the same reference numerals are used to indicate similar parts and the general construction is similar to that shown in Figures 5 and 6 but the insert is supplied in the form for example of a paper, cellulose or plastics material rod or tube 60 which passes through crimping rollers 61, 62 which rotate in the direction of the arrows 63, 64 and which act to crimp the rod or tube 60 as indicated at 65. The insert is now fed into the tobacco material layers 26 and 27. The speed of rotation of the crimping wheels 61, 62 and the drums 1 and 2 is arranged to synchronise appropriately.

Figure 8 shows apparatus for feeding pulsed rods, tubes, cylinders or capsules axially into apparatus generally similar to that shown in Figure 1 but with the apparatus for applying the second layer 27 downstream of the drum for applying the first layer 26. In this construction however a secondary conveyor 70 is provided beneath which is a vacuum box 71. Rods, tubes, cylinders or capsules 72 fed by a vibro-mechanical or pneumatic feed to a curved delivery chute 73 from which they are moved individually by an accelerator wheel 74 at spaced intervals to the conveyor 70. Thus they are delivered to the conveyor 70 at spaced intervals and from the conveyor are placed onto the layer 26 where they are held by the vacuum in the chambers 13 and 15. The second layer 27 is supplied by the drum 1 and conveyor 6 in the manner described above, the axis of delivery 25a into the combining zone is again co-axial with the axis of each insert in that zone.

Figure 9 shows a construction similar to Figure 8 but in which the inserts, which are in the form of interrupted short lengths of rods, tubes or slugs of material, indicated by reference numeral 72 are initially fed as a continuous

length of material 75 in the direction of the arrow 76 from a suitable bulk source or in-line production machine, not shown, to a knife and ledger 77 where they are cut into the required length and are delivered to the accelerator wheel 74 which operates in a similar manner to that described with regard to Figure 8.

The construction shown in Figure 10 is similar to that described with regard to Figure 9 but in this arrangement the second drum 1 and the conveyor 6 are replaced by a tobacco funnel 34 as described and shown in Figure 4.

Figure 11 shows a construction similar to that shown in Figure 1 but in this case the insert 79 is provided in the form of pulsed or continuous powder or fluid which is placed onto the layer of material 26 by a pressure pipe 80, the axis 80a of which acts as a feed axis and is co-axial with the axially extending insert produced in the tobacco.

In all the arrangements described above a second layer of tobacco material 27 is applied to the first layer 26 but if desired the apparatus for applying the second layer can be omitted and the first layer with its inserts carried along to, for example, a garniture which acts to fold the layer 26 around the insert and, if desired, subsequently wrap it with a paper wrapper. Such an arrangement is shown in Figure 12 where the garniture is indicated by reference numeral 90.

An alternative construction is shown in Figures 13 and 14. In this arrangement a foraminous conveyor 100 is provided, the direction of movement of which is indicated by arrow 101. This passes through a combining zone the entry to which is indicated by broken line 102. In the combining zone the surface of the conveyor extends in a straight line

and substantially horizontally and is parallel to a continuous axially extending insert 103 which has a co-axial feed axis 104. The conveyor 100 is guided near the combining zone 102 by a roller 105 and the conveyor also passes around an inclined roller 106 the axis of rotation of which is inclined to the axis of the roller 105, thus, as the conveyor 100 moves from the roller 106 to the roller 105 it is twisted.

The layer of tobacco material is applied to the conveyor 100 by a tobacco funnel 107 the direction of movement of the tobacco being indicated by arrows 108. The layer 109 of deposited tobacco material on the conveyor is held in place by a vacuum supplied by a vacuum box 110 behind the conveyor.

A second layer of tobacco 111 is applied in the combining zone 102 from beneath the insert 104 by a tobacco funnel 112, the direction of movement of the tobacco therein being indicated by arrows 113.

As for be it most clearly seen from Figure 14 the funnel 107 is arranged so that it is clear of the insert 104 as it progresses along its feed axis so that tobacco material can be applied to the conveyor 100 without disturbance from the continuous insert.

As with the previous Figures the thickness of the layers of tobacco on the conveyor following each funnel is regulated by the amount of tobacco fed into each funnel and by tamping down or trimming off with ecretures not shown.

If required to avoid twisting the conveyor 100 as it passed through the funnel 107 a further roller 114 inclined at the same angle as roller 106 but placed on the discharge side of funnel 107 can be employed to guide the conveyor 100



such that it twists on itself between the roller 105 and 114.

Figures 15 to 22 are diagrammatic cross-sectional views of a rod of smoking material, for example tobacco or a filter material, showing various examples of how the insert can be arranged. In Figure 15 the insert 25 is arranged coaxially within the rod. In Figure 16 the insert 25 is located axially within the rod but to one side thereof. Figure 17 shows a coaxial insert 25 of rectangular cross-section, and Figure 18 shows the insert as being of "star" shaped cross-section again arranged coaxially. It will be appreciated that in Figures 17 and 18 the inserts need not be co-axial but could be to one side.

Figure 19 shows two axially extending inserts and Figure 20 shows an insert 25 which is made up from a tube 91 of combustible material with an inner filler of, for example, flavouring or tobacco of a different flavour. This insert is arranged co-axially but, as referred to above, could be displaced to one side. In Figure 21 the insert 25 is in the form of a powder or granular material and is arranged co-axially, and in Figure 22 the insert extends diametrically across the rod and is in the form of three layers 93, 94, 95 of, for example, flavouring material or tobacco of different qualities to that from which the rest of the rod is made.

In the arrangements described above the rod is referred to as being made from tobacco material but it could be manufactured from filter material and the inserts being of appropriate materials as required to produce the desired filter effect.

CLAIMS

1. A process for manufacturing a rod of smoking material with a continuous or interrupted axially extending insert includes applying a layer of material to the surface of a conveyor and combining said material on the conveyor and the insert in a combining zone which extends along a substantially straight axis in which the plane of the surface of the conveyor and the axis of the insert are substantially parallel, and which includes applying said layer of material to the conveyor outside said combining zone with the plane of the surface of the conveyor in a different plane to that of its surface in the combining zone.
2. A process as claimed in claim 1 in which the insert is moved into the combining zone along a feed axis co-axial with the axis of the insert when in the combining zone.
3. A process as claimed in claim 2 in which the insert is in the form of a continuous element or is applied as a spray.
4. A process as claimed in claim 3 in which the continuous element is substantially rigid or inflexible.
5. A process as claimed in claim 2, claim 3 or claim 4 in which the insert is in the form of a rod, tube or cylinder.
6. A process as claimed in claim 1 or claim 2 in which the insert is in the form of spaced rods, tubes, cylinders, slugs or capsules or is applied as an interrupted spray.

7. A process as claimed in claim 1 or claim 6 which includes providing an interrupted axially extending insert along a curved path into the combining zone.

8. A process as claimed in claims 1 to 7 which includes supplying said material to a foraminous conveyor and applying a vacuum to hold it in place thereon.

9. A process as claimed in claim 8 in which the insert may also be at least partially held in place by the vacuum.

10. A process as claimed in claims 1 to 9 which includes providing a layer of smoking material on a first face of a moving foraminous conveyor, applying a vacuum to a second face of the conveyor, applying an insert to the outer face of said layer and applying a further layer of smoking material over said insert.

11. A process as claimed in claims 1 to 10 which includes transporting said material and insert to wrapping means.

12. A process as claimed in claims 1 to 11 which includes supplying said material to a foraminous belt whilst it passes around a foraminous drum within which the vacuum is applied.

13. A process as claimed in claims 1 to 12 in which the material is applied to the conveyor at a point where the plane of the surface of the conveyor is inclined in relation to its plane in the combining zone.

14. A process as claimed in claims 1 to 13 in which a second layer is applied by a second foraminous belt to which a vacuum is applied.

15. A process as claimed in claim 14 in which the smoking material is applied to the second foraminous conveyor whilst it passes around a foraminous drum within which a vacuum is applied.

16. Apparatus for carrying out the process set forth in any one of the preceding claims which comprises means for applying a layer of smoking material to the surface of a conveyor, means for combining said material on the conveyor and a continuous or interrupted axially extending insert in a combining zone which extends long a substantially straight axis, in which the plane of the surface of the conveyor and the axis of the insert are substantially parallel and in which said means for applying the material to the conveyor are outside the combining zone and apply the material at a point where the surface of the conveyor is in a different plane to that of its surface in the combining zone.

17. Apparatus as claimed in claim 16 in which means are included for moving said insert into the combining zone along a feed axis co-axial with the axis of the insert when in the combining zone.

18. Apparatus as claimed in claim 16 in which means are included for moving an interrupted axially extending insert along a curved path into the combining zone.

19. Apparatus as claimed in claims 16 to 18 comprising means for providing a layer of smoking material on a first face of a moving foraminous conveyor, means for applying a vacuum to a second face thereof, means supplying an insert to the outer face of said layer and means for applying a further layer of smoking material over said insert.

20. Apparatus as claimed in claim 19 in which means are provided for supplying said layer of smoking material to

said foraminous conveyor whilst it passes over a foraminous drum within which said vacuum is applied.

21. Apparatus as claimed in claim 19 in which the material can be applied to the conveyor at a point where the plane of the surface of the conveyor is inclined or twisted in relation to its plane in the combining zone.

22. A process for manufacturing a rod of smoking material as claimed in claim 1 and substantially as described herein with reference to and as shown in the accompanying drawings.

23. Apparatus for manufacturing a rod of smoking material as claimed in claim 16 and substantially as described herein with reference to and as shown in the accompanying drawings.

24. A rod of smoking material made by the process set forth in claims 1 to 15 and claim 22.

Examiner's report to the Comptroller under  
Section 17 (The Search Report)

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## Relevant Technical fields

(i) UK Cl (Edition L ) A2C CEFB CGFC

(ii) Int Cl (Edition 5 ) A24C 5/18

## Databases (see over)

(i) UK Patent Office

(ii)

## Search Examiner

M ELLIOTT

## Date of Search

28 JANUARY 1993

Documents considered relevant following a search in respect of claims 1 TO 24

Category (see over)	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2170985 A	(TOBACCO RESEARCH DEV INST LTD) whole document	1 at least
X	GB 2170692 A	(BRITISH-AMERICAN TOBACCO CO LTD) whole document	1 at least
X	GB 2069310 A	(MOLINS LTD) whole document	1 at least

Category	Identity of document and relevant passages	Relevant to claim(s).

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